



US005865846A

United States Patent [19]**Bryan et al.**[11] **Patent Number:** **5,865,846**[45] **Date of Patent:** **Feb. 2, 1999**[54] **HUMAN SPINAL DISC PROSTHESIS**[76] Inventors: **Vincent Bryan**, 4624 E. Mercer Way,
Mercer Island, Wash. 98040; **Alex
Kunzler**, 4422 140th, SE., Bellevue,
Wash. 98002

4,997,432	3/1991	Keller	623/17 X
5,192,326	3/1993	Bao et al.	623/17
5,246,458	9/1993	Graham	606/87 X
5,370,697	12/1994	Baumigartner	123/17
5,556,431	9/1996	Buttrre-Janz	623/17
5,674,294	10/1997	Bainville et al.	623/17

[21] Appl. No.: **856,513**[22] Filed: **May 15, 1997***Primary Examiner*—Mary Beth Jones*Attorney, Agent, or Firm*—Hill & Simpson

[57]

ABSTRACT**Related U.S. Application Data**[60] Division of Ser. No. 681,230, Jul. 22, 1996, Pat. No.
5,674,296, which is a continuation-in-part of Ser. No. 339,
490, Nov. 14, 1994, abandoned.[51] **Int. Cl.⁶** **A61F 2/44**[52] **U.S. Cl.** **623/17; 606/61; 606/86;**
606/87[58] **Field of Search** 623/16, 17; 606/60,
606/61, 72, 73, 86, 87[56] **References Cited****U.S. PATENT DOCUMENTS**

2,677,369	5/1954	Knowles	623/17
4,599,086	7/1986	Doty	616/61 X
4,911,718	3/1990	Lee et al.	623/17
4,932,969	6/1990	Frey et al.	623/17

The invention relates to a spinal disc endoprosthesis. The endoprosthesis has a resilient body formed of one or more materials which may vary in stiffness from a relatively stiff exterior annular gasket portion to a relatively supple central nucleus portion. Concaval-convex elements at least partly surround that nucleus portion so as to retain the nucleus portion and gasket between adjacent vertebral bodies in a patient's spine. Assemblies of endoprosthetic discs, endoprosthetic vertebral bodies, and endoprosthetic longitudinal ligaments may be constructed. To implant this endoprosthesis assembly, information is obtained regarding the size, shape, and nature of a patient's damaged spine. Thereafter, one or more prosthetic vertebral bodies and disc units are constructed in conformity with that information. Finally, the completed and conformed vertebral body and disc assembly is implanted in the patient's spine.

9 Claims, 10 Drawing Sheets